CHAPTER 7

Authorized Frequency Usage

7.0 GENERAL

Within the jurisdiction of the United States Government, use of the radio frequency spectrum for radio transmissions for telecommunications or for other purposes shall be made by United States Government stations only as authorized by the Assistant Secretary.

The frequency assignments mentioned in Part 7.2 result from the submission of applications by Government agencies (see Chapter 9). The other parts of this chapter contain authority for the use of certain frequencies under specified conditions, and the submission of applications therefore is not required.

7.1 LASERS AND OTHER SYSTEMS THAT OPERATE ABOVE 3000 GHz

No authorization is required for the use of frequencies above 3000 GHz. As a matter of information, agencies may inform the IRAC of such usage, but no record of it shall be kept in the Government Master File (GMF), the list of Frequency Assignments to Government Radio Stations.

NTIA has the authority under the Communications Act of 1934, as amended, to license stations that operate above 3000 GHz, including lasers, but at this time does not choose to do so.

7.2 USE OF FREQUENCIES CONTAINED IN THE LIST OF FREQUENCY ASSIGNMENTS TO GOVERNMENT RADIO STATIONS

The frequency assignments contained in the Government Master File (GMF) may be used by Government agencies in accordance with the particulars of those assignments.

The complete listing of Government frequency assignments, the GMF is also an important tool for spectrum management activities. Accordingly, data requirements for the particulars of frequency assignments in the GMF may be revised, updated, and expanded as needed to meet changing spectrum management requirements.

7.3 USE OF FREQUENCIES FOR EMERGENCY, DISASTER, OR WAR COMMUNICATIONS

7.3.1 Emergency Communications

In an emergency it is permissible to operate temporarily on regularly assigned frequencies in a manner other than that specified in the terms of an existing assignment or on other appropriate frequencies under the following special circumstances:

An emergency must actually exist or imminently threaten. An emergency for the purpose of this provision means a situation of temporary duration resulting directly or indirectly from a natural catastrophe or other occurrence that seriously affects the welfare of a community or of an area to the extent of endangering human life and property and in connection with which special communication facilities are required temporarily.

Emergency operations shall be discontinued as soon as substantially normal communication facilities are restored.

U.S. Government stations may use the frequency 5168.9 kHz (carrier frequency 5167.5 kHz), with maximum power of 150 watts PEP, for emergency communications in the State of Alaska. Airborne stations are not authorized to use this frequency. Stations operating on this frequency shall be located within the State of Alaska or within 92 kilometers of its boundaries.

7.3.2 Disaster Communications

U.S. Government agencies may use the frequencies listed below, with the technical particulars as shown, on a nonexclusive basis. These frequencies are to provide for essential communications incident to or in connection with disasters

or other incidents that involve loss of communication facilities normally available or that require the temporary establishment of communication facilities beyond those normally available.

For the purpose of this authority, a disaster is an occurrence of such nature as to involve the health or safety of a community or large area, or the health or safety of any group of individuals in an isolated area to whom no normal means of communication are available, and includes, but is not limited to, floods, earthquakes, hurricanes, explosives, aircraft or train wrecks, and consequences of armed attack.

U.S. Government operations in the disaster communication service shall be in accordance with plans formulated by competent local authorities. Duly designated civil defense officials will be considered competent local authority in the organization or operation of disaster communication radio networks and stations.

The power used shall be the minimum necessary to effect the required communications, taking into account the necessity of avoiding harmful interference to other disaster communication stations. In no case shall the power into the antenna exceed limits indicated below.

Frequency (kHz)	Emission	Maximum Power (kW)	Class of Station	Record Note[1]
1750.5	100HA1A	0.5 pX	FX FL MO	S034
1751.5	do	do	do	do
1752.5	do	do	do	do
1753.5	do	do	do	do
1754.5	do	do	do	do
1755.5	do	do	do	do
1756.5	do	do	do	do
1757.5	do	do	do	do
1761.5	100HA1A	0.5 pX	do	do
do	2KA2A	0.75 pX	do	do
do	5KA3E	0.25 pY	do	S154
1768.5	6KA3E	0.25 pY	do	S034
1775.5	do	do	do	do
1782.5	do	do	do	do
1789.5	do	do	do	do
1796.5	do	do	do	do

[1]S034--Disaster Communications; S154--Scene of disaster frequency.

7.3.3 War Emergency Communications

Executive Order 12472, April 3, 1984, assigns responsibility for the development of plans and procedures concerning radio spectrum assignments, priorities, and allocations for use by Federal departments and agencies to the Secretary of Commerce. The responsibility applies under all circumstances, including those of crisis or emergency. The Director of the Office of Science and Technology Policy (OSTP) further designated the Secretary of Commerce to assist OSTP in the development and administration of a system of radio spectrum priorities. The Director, OSTP, however, retains authority to certify or approve spectrum priorities and to resolve any conflicts among competing priorities.

The responsibilities delegated to the Secretary of Commerce have been delegated in turn to the Assistant Secretary for Communications and Information (Administrator, NTIA). Provisions for the use of frequencies by Government agencies under war emergency conditions are contained in the current editions of the *Emergency Readiness Plan for Use of the Radio Spectrum* and the *Emergency Spectrum Management Operations Plan*. NTIA is thus responsible for the preparation, maintenance, and dissemination of these documents, and shall ensure that the information contained therein accurately reflects the projected war emergency spectrum usage and priority requirements of Federal departments and agencies.

7.3.4 Emergency Use of Non-Government Frequencies

In emergency situations a government radio station may utilize any frequency authorized to a non-government radio station, under Part 90 of the FCC Rules and Regulations, when such use is necessary for communications with non-government stations and is directly related to the emergency at hand. Such use is subject to the following conditions:

a. The non-government licensee has given verbal or written concurrence.

b. Operations are conducted in accordance with the FCC Rules and Regulations.

c. Use is restricted to the service area and station authorization of the licensee.

d. All operations are under the direct control of the licensee and shall be immediately terminated when directed by the licensee.

e. Operations do not exceed 60 days.

f. A written report of each such use shall be provided, through the agency's FAS representative, to the FCC as soon as practicable.

7.3.5 Emergency Use of Government HF Frequencies for the Shared Resources (SHARES) Program

The National Communications System (NCS) SHARES HF Radio Program is a key element in the development of a national telecommunications infrastructure using presently authorized HF radio networks and cooperating Federal Agencies. SHARES is a collection of existing Federal Agency controlled HF stations that will interoperate to exchange national security emergency preparedness (NSEP) traffic for any Federal entity during a crisis or emergency. Participating agencies agree to accept SHARES actual or simulated emergency traffic, assuming responsibility for delivery or relay to the extent it does not interfere with their own agency mission. The SHARES HF Radio Program supports Executive Order 12472, 12656, and NSDD-97 initiatives.

Agencies providing frequencies for the NCS SHARES Program must have a US&P assignment in the GMF, with Record Notes S296 and S381. Additionally, the Circuit Remarks field must contain *NTS,M002,IRAC 24902 which defines the NCS SHARES concept of operation. Operations under these assignments are limited to SHARES operations and tests.

Participating agencies in the NCS SHARES HF Radio Program are authorized to test the operating system periodically provided the respective Agency FAS Representatives are notified at least thirty (30) days in advance.

7.4 USE OF FREQUENCIES BY FIXED AND LAND STATIONS

When it is indispensable to do so, and on the condition that the characteristics of the stations continue to conform to those in the GMF, a fixed station may, on a secondary basis, transmit on its assigned frequencies to mobile stations, and a land station may, on a secondary basis, transmit on its assigned frequencies to fixed stations or other land stations in the same category.

7.5 USE OF FREQUENCIES BY MOBILE STATIONS

7.5.1 Frequencies Assigned to Government Stations in the Mobile Service and Mobile Earth Stations

A mobile station may transmit on a frequency assigned to a Government station in the mobile service a) when directed to do so by the latter for the specific purpose of communicating with the station issuing the directive or with other stations in the same net or b) by directive from the agency operating the stations to which the frequency is assigned.

7.5.2 Frequencies Authorized by the FCC for Ship Stations

Frequencies authorized by the Federal Communications Commission for ship stations may be used by Government mobile stations to communicate with non-Government stations in the maritime mobile service.

7.5.3 Frequencies for the Safety of Life and Property

1. Aircraft, ship, survival craft and mobile earth stations may use the following frequencies provided such use is in accordance with the ITU Radio Regulations and Appendices as indicated:

500 kHz	Nos. S5.82, Ap. S13 Part A2, Section I,A, § 1
*2182 kHz	Nos. S5.108, Ap. S13 Part A2, Section I,B, § 2, Ap. S15
*3023 kHz	Ap. S15, Ap. S13 Part A2, Section I,D, § 3, Ap. S13 Part A2, Section I,F, § 5, Ap. S15, Ap. S27, also see Section 8.2.24 of this Manual

*4125 kHz	Ap. S15, Ap. S13 Part A2, Section I, E, § 4, 1 and 2
*5680 kHz	See 3023 kHz above
*6215 kHz	Ap. S13 Part A2, Section I, G, § 6, Ap. S15
8364 kHz	Ap. S13 Part A2, Section I,H, § 7
121.5 MHz	Nos.S5.200, Ap. S13 Part A2, Section I, I, § 8, 1A and 1B, Ap. S15
123.1 MHz	Nos.S5.200, Ap. S13 Part A2, Section I, I, § 8, 1B and 2, Ap. S15
156.3 MHz	Ap. S13 Part A2, Section I, J, § 9, Ap. S15
156.8 MHz	Nos.S5.226, Ap S13 Part A2, Section I, L, § 10, 1 and 3, Ap. S15
243 MHz	Nos.S5.256, Ap. S13 Part A5, Section I, § 1, b
406-406.1 MHz	Nos.S5.266, Ap. S13 Part A2, Section I, N, § 10B, Ap. S15
1645.5-1646.5 MHz	Nos.S5.375, Ap. S13 Part A2, Section I, P, § 10D, Ap. S15

* Carrier frequencies

2. Mobile stations in the maritime mobile service, and mobile earth stations, may also use the following frequencies provided such use is in accordance with the provisions of ITU Radio Regulation No. S30.4 and Appendix S15.

3. Ship stations may use the frequencies 156.650 and 156.375 MHz for ship-to-ship and ship-to-shore communications related to the safety of navigation in accordance with the Vessel Bridge-to-Bridge Radiotelephone Act (Public Law 92-63). (See ITU Radio Regulation Ap. S13 Part A2, Section I, K, § 9B, Ap. S15, and Section 8.2.29 of this Manual.)

4. Emergency Position Indicating Radiobeacons (EPIRB) operating on the frequencies 156.75 and 156.8 MHz may be used aboard U.S. Government vessels that operate within 32 kilometers of shore and in the Great Lakes.

5. The frequency 40.5 MHz is designated as the military joint common frequency. Use of this channel is limited to communications necessary to establish contact when other channel information is not available and for emergency communications. This frequency also may be used for search and rescue communications.

6. The provisions of this Manual do not prevent mobile stations, or mobile earth stations, in distress from using any frequency at its disposal to attract attention, make known its position, and obtain help. (See ITU Radio Regulation Ap. S13 Part A1, § 6,1.)

7. To enhance protection of life and property, it is mandatory that each Emergency Position Indicating Radiobeacon (EPIRB), Emergency Locating Transmitter (ELT) or Personal Locator Beacon (PLB) operating on 406.025 MHz be registered with NOAA. Agencies shall advised NOAA in writing of any change in registration information. Initial registration forms are provided by the equipment manufacturer. NOAA will provide registrants with confirmation of registration and change of registration postcards.
NOAA's address is: NOAA/NESDIS, SARSAT Operations Division, E/SP3, Federal Building #4, Room 0158, Washington, DC 20233. As an alternative, agencies may make special arrangements for the registration of these devices directly with the NOAA/NESDIS SARSAT Operations Division.

7.5.4 Frequencies for Coordinating Search and Rescue Operations

1. The carrier frequencies 3023 and 5680 kHz (Ap. S15, Ap. S13 Part A2, Section I, D, § 3, Ap. S13 Part A2, Section I, F, § 5, and Part II, Appendix S27) may be used by mobile stations for intercommunication between mobile stations engaged in coordinated search and rescue operations, including communication between the mobile stations and participating land stations, provided such use is in accordance with the provisions of Ap. S13 Part A2, Section I, D, § 3, Ap. S15, Ap. S13 Part A2, Section I, F, §5, and Ap. S15 of the ITU Radio Regulations and Appendix S27. Govern-ment mobile stations shall use J3E emission, upper sideband only, when all stations participating in a search and rescue operation are capable of using that emission. Emissions A1A, A3E or H3E may also be used if necessary.

2. The frequency 123.1 MHz, using class A3E emission, may be used by stations of the aeronautical mobile service and by other mobile and land stations engaged in coordinated search and rescue operations.

3. The frequency 156.3 MHz may be used for

communications between ship stations and aircraft stations, using G3E emission, engaged in coordinated search and rescue (SAR) operations. When control of the scene of a SAR incident is under a Coast Guard coast station, 156.3 MHz may be used by ship stations to communicate with that coast station.

7.5.5 Coast Station Frequencies

A mobile station may transmit on the same frequency as the coast station with which it is communicating, provided that a) the emission satisfies the frequency tolerance applicable to the coast station, b) the coast station requests the transmission, and c) no harmful interference is caused to other stations.

7.5.6 Frequencies for Marine Environmental Protection Operations

The frequency 157.075 MHz, 16K0F3E emission, may be used by mobile stations, and for portable-type operations, for communications required to coordinate marine environmental protection operations, e.g., communications pursuant to the Joint Canada-United States Marine Contingency Plan for Spills of Oil and Other Noxious Substances. All use of this frequency under this authority shall be in accordance with plans formulated by competent environment-protection authorities and shall be under the operational control of the designated on-scene commander/coordinator or deputy on-scene commander/coordinator.

7.5.7 Ship Station Frequencies in the Bands 4000-4063 and 8100-8195 kHz

Ship stations may transmit (emission: 2K80J3E), with power not exceeding 1.5 kW PEP, on frequencies designated for radiotelephony in the channeling plans of Section 4.3.13 for intership and ship-shore radiotelephony communications, provided no harmful interference is caused to other authorized users.

7.6 USE OF FREQUENCIES BY AIRCRAFT STATIONS

Aircraft stations of any Government agency may use any aeronautical mobile (R) band frequency below 30 MHz for communication only with aeronautical stations regularly serving the routes or areas to which those frequencies are specifically allotted by international agreement. Further, any high frequency authorized by the Federal Communications Commission for aircraft stations may be employed by aircraft stations of any Government agency when communicating for safety purposes with aeronautical stations to which such frequencies are assigned, after arrangements have been made with the licensee of the non-Government aeronautical stations for this use.

Since military aircraft will use UHF in lieu of VHF to the maximum extent practicable, aircraft stations of any Government agency may use any frequency in the bands 117.975-123.0875, 123.5875-128.8125, and 132.0125-137.000 MHz for air traffic control, ground control, aeronautical advisory, aeronautical multicom, and flight service communication, as appropriate, only with aeronautical stations regularly serving the routes or areas to which those frequencies are authorized specifically. All operations by Government aircraft stations under the provisions of this paragraph shall be restricted to the purpose for which the particular frequency is allotted and authorized to the Government or non-Government aeronautical station.

All operations by Government aircraft stations under the provisions of the two preceding paragraphs shall comply with the appropriate provisions of Part 87 of the FCC Rules. Such provisions include, but are not limited to, those pertaining to power, type of emission, scope of service, permissible communications, and frequencies available, noting that the FCC does not issue type acceptance for equipment used aboard Government-owned and operated aircraft.

The frequency 122.925 MHz may be used with 6K00A3E emission by aircraft when coordinating natural resources programs of Federal or State natural resources agencies, including forestry management and fire suppression, fish and game

management and protection, and environmental monitoring and protection.

Radionavigation mobile stations aboard aircraft of any Government agency may utilize frequencies in the 1025-1150 MHz band to operate with directly associated ground-based facilities in TACAN/DME and ATCRB systems, and frequencies in the 4200-4400 MHz band to operate radio altimeters.

7.7 USE OF FREQUENCIES BY MANNED SPACECRAFT

Stations aboard manned spacecraft may use the emergency, distress, survival craft, and search and rescue frequencies (2182 kHz, 3023 kHz, 5680 kHz, 8364 kHz, 121.5 MHz, 156.8 MHz and 243 MHz) of the aeronautical mobile and maritime mobile services for these purposes under the same rules and restrictions applicable to those services.

7.8 PURCHASE AND USE OF NON-LICENSED DEVICES

Federal Government agencies may purchase "off-the-shelf" non-licensed devices that conform to the applicable edition of Part 15 of the Federal Communication Commission's (FCC) Rules and Regulations (47 CFR 15) without further authority from the Assistant Secretary.

Non-licensed devices subject to FCC certification, notification or verification shall bear the appropriate FCC statement of limitations to operations.

The agency operating a non-licensed device that causes interference to an authorized radio service shall promptly take steps to eliminate the interference. Upon notification by cognizant spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiations from the device until the interference is eliminated.

Agencies operating a purchased non-licensed device have no vested or recognized right to continued use of the device in any part of the radio frequency spectrum. Non-licensed device operations must accept any interference from any Federal or non-Federal authorized radio system, other non-licensed device, or industrial, scientific and medical (ISM) equipment.

7.9 DEVELOPMENT AND USE OF NON-LICENSED DEVICES

Annex K is based on Part 15 of the FCC's Rules and Regulations (47 CFR 15) which governs non-Federal use of radio frequency devices that do not require an individual license to operate (i.e., "non-licensed devices"). Federal Government telecommunication operations do not require an FCC license or authorization. The term "non-licensed device" used in this Part refers only to Federal devices - and operations of such devices - that conform to the technical criteria in Annex K.

Agencies may develop and operate devices that conform to the technical criteria in Annex K without further authority from the Assistant Secretary. Additionally, any operational capability that conforms to the technical criteria in Annex K may be incorporated into otherwise authorized telecommunication systems without further authority from the Assistant Secretary.

The agency operating such developed devices that cause interference shall take steps to eliminate the interference. Upon notification by cognizant spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiations from the device until the interference is eliminated.

Agencies operating a device developed under the technical criteria of Annex K, have no vested or recognized right to continued use of the device in any part of the radio frequency spectrum. These devices must accept any interference from any authorized Federal or non-Federal radio system, other non-licensed device, or industrial, scientific or medical (ISM) equipment.

7.10 USE OF FREQUENCIES BY INDUSTRIAL, SCIENTIFIC, AND MEDICAL (ISM) EQUIPMENT

Without further authority from the Assistant Secretary, ISM equipment may be operated under the conditions specified in this part for particular categories of equipment or types of operations.

7.10.1 Operation on Particular Frequencies Designated for ISM Equipment

The following frequencies are designated for use by ISM equipment, the emissions of which shall be confined within the frequency limits associated with each frequency:

6780 kHz	±15.0 kHz
13560 kHz	±17.0 kHz
27120 kHz	±163.0 kHz
40.68 MHz	±20.0 kHz
915 MHz	±13.0 MHz
2450 MHz	±50.0 MHz
5800 MHz	±75.0 MHz
24.125 GHz	±125.0 MHz
61.25 GHz	±250.0 MHz
122.5 GHz	±500.0 MHz
245 GHz	±1.0 GHz

In the event harmful interference is caused by ISM operation to any authorized radio service outside the frequency limits specified, the operator of the ISM equipment shall promptly take necessary steps to eliminate such interference, except in those cases where the interference is due to direct intermediate frequency pickup by a receiver of the fundamental frequency emissions of ISM equipment operating on an ISM frequency, and the operator otherwise complies with this section.

ISM equipment, other than industrial heating equipment, that is operated on the frequencies 915, 2450, 5800 MHz, and 24.125 GHz, is subject to the following conditions:

1. The energy radiated and the bandwidth of emission shall be reduced to the maximum extent practicable.

2. In the event harmful interference is caused to authorized radio services from spurious or harmonic radiation from ISM equipment, the operation of the ISM equipment shall be discontinued until necessary measures have been taken to eliminate such interference.

Medical diathermy equipment may be operated on the designated ISM frequencies without regard to the type or power of emissions being radiated, except as specified above. However, any harmonic or other spurious radiation outside the frequency limits specified in this section shall be suppressed so as not to exceed a strength of 25 μV/m at a distance of 300 meters. Measurements to determine field intensity shall be made in accordance with standard engineering procedures.

Industrial heating equipment and RF stabilized arc welders may be operated with unlimited radiation on any designated ISM frequency, but shall be adjusted to operate as close to that ISM frequency as practicable. Filtering between the industrial heating equipment and power lines must be provided to the extent necessary to prevent the radiation of energy from power lines on frequencies other than those designated for ISM, with a field strength in excess of 10 μV/m at a distance of 1600 meters from the industrial heating equipment, and at a distance of 15 meters from the power line.

Miscellaneous ISM equipment may be operated on the designated ISM frequencies without regard to the type or power of emissions being radiated, provided any harmonic or other spurious radiation outside the frequency limits specified in this section is suppressed so as to not exceed:

25 μV/m at a distance of 300 meters or,

for equipment generating more than 500 watts of RF power on the fundamental frequency, 25 μV/m times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10 μV/m at 1600 meters, provided this increase is not permitted for equipment located in a predominantly residential area and operating on a frequency below 1000 MHz.

7.10.2 Operation on Frequencies Other than Those Designated for ISM Equipment

Operation of ISM equipment within the following safety, search and rescue frequency bands is prohibited: 490-510 kHz, 2170-2194 kHz, 8354-8374 kHz, 121.4-121.6 MHz, 156.7-156.9 MHz, and 242.8-243.2 MHz.

In the event harmful interference is caused to any authorized radio service outside the frequency limits specified in Section 7.10.1, by ISM operation conducted pursuant to this section, the operator of the ISM equipment shall promptly take the necessary steps to eliminate the interference.

Medical diathermy equipment shall be provided with a rectified and filtered plate power supply, powerline filters, and shall be constructed so that any radiated radio frequency energy (including harmonic or other spurious emissions) on a fre-

quency outside the frequency limits specified in Section 7.10.1 does not exceed a strength of 15 μV/m at a distance of 300 meters. Measurements to determine field intensity shall be made in accordance with standard engineering procedures.

Industrial heating equipment and RF stabilized arc welders may be operated provided all of the following conditions are met:

1. Radiation on the fundamental carrier frequency, as well as spurious and harmonic radiations resulting from any source frequency, and falling outside the frequency limits specified in Section 7.10.1, shall be suppressed so that

a) below 5725 MHz the field strength does not exceed 10 μV/m at a distance of 1600 meters and

b) above 5725 MHz it is reduced to the greatest extent practicable.

2. Filtering between the industrial heating equipment and power lines shall be provided to the extent necessary to prevent the radiation of energy from power lines on frequencies other than the designated ISM frequencies, with a field strength in excess of 10 μV/m at a distance of 1600 meters from the industrial heating equipment and at a distance of 15 meters from the power line.

Miscellaneous ISM equipment may be operated on frequencies other than those designated for ISM equipment provided all of the following conditions are met:

1. The equipment shall be provided with a rectified and filtered plate power supply and power line filters.

2. Any radiated radio frequency energy outside the frequency limits specified in Section 7.10.1 (including harmonic or other spurious emissions) shall not exceed:

15 μV/m at a distance of 300 meters; or, for equipment generating more than 500 watts of RF power on the fundamental frequency, 15 μV/m times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10 μV/m at 1600 meters, provided this increase is not permitted for equipment located in a predominantly residential area and operating on a frequency below 1000 MHz.

Operation of ultrasonic equipment shall not result in radiation exceeding the following limits:

1. Below 490 kHz

2400 μV/m at 300 meters ÷ Frequency (in kHz)

Between 490 and 1600 kHz

24000 μV/m at 30 meters ÷ Frequency (in kHz)

Over 1600 kHz (excluding frequencies within the limits specified in Section 7.10.1)

15 μV/m at 30 meters

2. For equipment operating below 490 kHz and generating more than 500 watts of RF power on the fundamental frequency.

2400 μV/m at 300 meters ÷ Frequency (in kHz) times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10 μV/m at 1600 meters, provided this increase is not permitted for equipment located in a predominantly residential area.

3. On any frequency 490 kHz and above, the radio frequency voltage appearing on each power line shall not exceed 200 μV; below 490 kHz it shall not exceed 1000 μV.

7.11 USE OF FREQUENCIES BY CERTAIN EXPERIMENTAL STATIONS

Except as provided in the following paragraph, Government experimental radio stations at the locations listed below are authorized to use any radio frequency for short or intermittent periods without prior authorization of specific frequencies provided that a) such operations are confined to the immediate vicinity of the station; b) the nature or duration of the requirement is such that the assignment of specific frequencies is impracticable; and c) all reasonable measures are taken before such frequencies are used to ensure that harmful interference will not be caused to authorized services, and, in this regard, consideration should be given to the propagation characteristics of the frequency to be utilized and to the operational nature of the services normally operating on frequencies of the order of that selected.

This authority is limited to radio frequency usage which is an integral part of an experimental operation and shall not be construed as authorizing frequency usage for administrative or operational use related thereto. No priority rights shall derive from the use of a specific frequency for an operation conducted pursuant to this authority nor shall any specific frequency usage constitute a bar

to the authorization of other uses. The following frequency bands are specifically excluded from this authority:

kHz	MHz	GHz
495.0-510.0	73.0-74.8	10.68-10.70
2173.5-2190.5	121.4-121.6	15.35-15.40
8354.0-8374.0	156.7-156.9	23.60-24.00
21850.0-21870.0	242.8-243.2	31.20-31.50
	1215.0-1240.0	52.00-54.25
	1400.0-1427.0	58.20-59.00
	1559.0-1610.0	64.00-65.00
	2690.0-2700.0	86.00-92.00
	4990.0-5000.0	101.00-102.00
		130.00-140.00
		182.00-185.00
		230.00-240.00

(This restriction shall not be construed as precluding the measurement of antenna characteristics in these bands. In such cases, however, the power delivered to the antenna under test shall be for the sole purpose of carrying out the desired measurements and shall be no greater than is required by the measurement technique being utilized.)

Experimental operations conducted pursuant to this authority shall be terminated immediately upon receipt of notice that harmful interference is being caused to an authorized service. To that end, the following listings of the experimental stations include sufficient information to permit the prompt delivery at all times of notices of harmful interference.

Agriculture, Department of
Forest Service
Information Systems and Technology Staff
P.O. Box 96090
Washington, DC 20090-6096
Telephone: 703-235-2096

Air Force, Department of the
Space and Missile Systems Center
SMC/SCOF
P. O. Box 92960
Los Angeles, California 90009-2960
Telephone: 310-363-1165, DSN: 833-1165

Air Force Flight Test Center
650 ABW/SCT
Building 3940, Room 153
35 N Wolfe Avenue

Edwards AFB, California 93524-1110
Telephone: 805-277-2390, DSN: 527-2390

Eastern Area Frequency Coordinator (EAFC)
45 CS/SCMMP
1225 Pershing Street
Patrick AFB, Florida 32925-3340
Telephone: 407-494-5837/5838,
DSN: 854-5837/5838
Fax: 407-494-5555; DSN: 854-5555

Air Force Development Test Center
96 CCSG/SCZ
102 North Second Ave. Ste.106
Eglin AFB, Florida 32542-6837
Telephone: 904-882-4416, DSN: 872-4416

6585 Test Group
Frequency Manager (DC)
Holloman AFB, New Mexico 88330-5000
Telephone: 505-479-1375, DSN: 867-1375

Phillips Laboratory/SCOS
3550 Aberdeen Avenue, S.E.
Kirtland AFB, New Mexico 87117-5776
Telephone: 505-846-1281, DSN: 246-1281

Rome Laboratory
525 Brooks Road
Griffiss AFB, New York 13441-4505
Telephone: 315-330-2243, DSN: 587-2243

Aeronautical Systems Center (AFMC)
RF Spectrum Management Branch
88th Communications Group/SCCF
2450 D Street, Bldg. 20, Area B
Wright-Patterson AFB, Ohio 45433-7629
Telephone: 937-255-2181, DSN: 785-2181

Electronics Systems Center (AFMC)
66SPTG/SCXC
50 Griffiss Street
Hanscom AFB, Mass. 01731-1621
Telephone: 617-377-7511, DSN: 478-7511

Area Frequency Coordinator
554CS/SCXF
5870 Devlin Drive
Nellis AFB, Nevada 89191-7075
Telephone: 702-652-3417, DSN: 683-3417

Geophysics Directorate of Phillips Laboratory
ESC/SCXM
50 Griffis Street
Hanscom AFB, Mass. 01731-1621
Telephone: 617-377-7511, DSN: 478-7511

Western Space & Missile Center
Frequency Manager (SFDS)
Vandenberg AFB, California 93437-6021
Telephone: 805-866-6695, DSN: 276-6695

Frank J. Seiler Research Laboratory (FJSRL)
U. S. Air Force Academy, Colorado 80840-6528
Telephone: 303-472-3120, DSN: 259-3120

Armstrong Laboratory
648 C-CSS/SCR
Brooks AFB, Texas 78235-6346
Telephone: 512-536-4765, DSN: 240-4765

Arnold Engineering Development Center
AEDC/SCX
100 Kindell Drive, Suite B111
Arnold AFB, Tennessee 37389-2111
Telephone: 615-454-5978, DSN: 340-5978

Air Force Civil Engineering Center
Frequency Manager (LG)
Tyndall AFB, Florida 32401-6001
Telephone: 904-283-6406, DSN: 970-6406

Army, Department of the
Commander
Aberdeen Proving Ground
ATTN: ASNC-TAB
Aberdeen, Maryland 21005-5055
Telephone: 301-278-4696 or 2211, Autovon: 870-4696 or 2211

Area Frequency Coordinator
ATTN: SFIS-FAC-SH
Fort Huachuca, Arizona 85613-6000
Telephone: 602-538-6423, or 6424, Autovon: 879-6423 or 6424

Commander
U. S. Army Communications-Electronics Command
ATTN: AMSEL-RD-ST-WL-AA
Fort Monmouth, New Jersey 07703-5203
Telephone: 732-427-2415, Autovon: 987-2415

Commander
Picatinny Arsenal
ATTN: ASNC-APT
Dover, New Jersey 07801-5001
Telephone: 201-328-4001, Autovon: 880-4001

Commander
Army Aviation and Missile Command
ATTN: AMSAM-RD-MG-GA
Redstone Arsenal, Alabama 35898-5253
Telephone: 205-876-1688; Autovon: 746-1688

Area Frequency Coordinator
ATTN: SFIS-FAC-SS
White Sands Missile Range,
New Mexico 88002-5526
Telephone: 505-678-3702 or 5417,
Autovon: 258-5417

Harry Diamond Laboratories
Communications-Electronics Office
2800 Powder Mill Road
Adelphi, Maryland 20783-1197
Telephone: 202-394-1804, Autovon: 290-1804

Central Intelligence Agency
Washington, D.C.
Telephone: 202-351-1100, Ext. 8185

Coast Guard
Coast Guard Research and Development Center
Avery Point
Groton, Connecticut 06340
Telephone: 203-446-1020, Ext. 251

Coast Guard Academy
Department of Engineering
New London, CT 06320
Telephone: 203-444-8546

Electronics Engineering Center
Wildwood, New Jersey 08260
Telephone: 609-522-7781

Field Testing and Development Center
Coast Guard Yard
Curtis Bay, Maryland 21226
Telephone: 301-789-1600

Coast Guard Telecommunications and Information Systems Command
Alexandria, Virginia 22315
Telephone: 703-313-5700 (Duty Hours)
703-313-5400 (Off-Duty Hours)

Commerce, Department of
NIST; NOAA/NGDC, ERL, MASC, ARL; NTIA/ITS
Boulder Laboratories and Associated Field Activities-NOAA R/E1
325 Broadway
Boulder, Colorado 80303
Telephone: 303-497-6548
FTS: 320-6548
Radio Freq. Management Officer

NOAA/ERL
Boulder Atmospheric Observatory
c/o Department of Commerce
325 Broadway
Boulder, Colorado 80303
Telephone: 303-497-6816
FTS: 320-6816

NOAA/ERL
Erie Remote Sensor Observing Site
c/o Department of Commerce
Boulder Laboratories-NOAA R/E/WP6
325 Broadway
Boulder, Colorado 80303
Telephone: 303-828-4603

NOAA/ERL
Platteville Field Station
c/o Department of Commerce
Boulder Laboratories-NOAA R/E/WP4
325 Broadway
Boulder, Colorado 80303
Telephone: 303-497-6385
FTS: 320-6385

NOAA/ERL
Fritz Peak
Route 4, Box 500
Golden, Colorado 80401
Telephone: 303-497-3436
FTS: 320-3436

NIST
Radio Stations WWV, WWVB, and WWVL
2000 East County Road 58
Fort Collins, Colorado 80521
Telephone: 303-444-3507 or 303-497-3914
FTS: 323-5228 or 320-3914

NBS/NML
Radio Station WWVH
P.O. Box 417, Kekaha
Kauai, Hawaii 96572
Telephone: 808-335-4361 or 4362

NOAA/NWS
Sterling Research and Development Center
Sterling, Virginia 22170
Telephone: 703-471-5302 ATTN: Mr. Cummings

Energy, Department of
Los Alamos National Laboratory
Los Alamos, New Mexico 87115
Telephone: 702- 295-4766
702-734-3343 (nights and holidays)

Lawrence Livermore National Laboratory
Livermore, California 94551
Telephone: 702-295-4766
702-734-3343 (nights and holidays)

Sandia National Laboratory
Livermore, California 94551
Telephone: 702-295-4766
702-734-3343 (nights and holidays)

Nevada Test Site
Mercury, Nevada 89023
Telephone: 702-295-4766
702-734-3343 (nights and holidays)

Frequency Coordinator
U.S. Department of Energy
Nevada Operations Office
Las Vegas, Nevada 89114
Telephone: 702-295-4766
702-734-3343 (nights and holidays)

Sandia National Laboratory
Albuquerque, New Mexico 87115
Telephone: 505-845-8028

Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho 83402
Telephone: 208-526-0600
208-526-1515 (nights and holidays)

Federal Aviation Administration
Technical Center
Atlantic City, New Jersey 08405
Telephone: 609-484-5509

Aeronautical Center
Spectrum Management Officer, AML-500
Mike Monroney Center
6500 South MacArthur
Oklahoma City, Oklahoma 73125
Telephone: 405-954-7922

Federal Communications Commission
Equipment Construction and Installation Branch
Federal Communications Commission
P.O. Box 65
Powder Springs, Georgia 30073
Telephone: 404-943-6425; FTS: 8-242-4202

FCC Laboratory
Federal Communications Commission
P.O. Box 429
Columbia, Maryland 21045
Telephone: 301-725-1585

Federal Communications Commission
Allegan Office
P.O. Box 89
Allegan, Michigan 49010
Telephone: 616-673-2063;
FTS: 372-5289

Health, and Human Services, Department of
National Institute of Health
Bethesda, Maryland
Telephone: 496-4328 (Day) 496-5685 (24 Hr)

Power Source Laboratory
Division of Electronic Products
Bureau of Radiological Health
12720 Twinbrook Parkway
Rockville, Maryland 20852
Telephone: 301-443-3840 (Mr. Swicord or Mr. Herman)

Justice, Department of
Engineering Research Facility
Building 27958A
Quantico, Virginia 22135
Attention: Radio Engineering Unit
Telephone: (703) 632-6701
FAX: (703) 632-6694

National Aeronautics and Space Administration
Spectrum Manager
Ames Research Center
Code EDN/233-18
Moffett Field, CA 94035
Telephone: 415-604-6846/6915
FAX: 415-604-6780

Spectrum Manager
Dryden Flight Research Facility
Code OFI
Edwards, CA 93523
Telephone: 805-258-3152

Spectrum Manager
Goddard Space Flight Center
Code 502
Greenbelt, MD 20771
Telephone: 301-286-8371

Spectrum Manager
Jet Propulsion Laboratory
Mail Stop 303-404
4800 Oak Grove Drive
Pasadena, CA 91109
Telephone: 818-354-0068, DSN: 640-1550

Spectrum Manager
Kennedy Space Center
Code TE-COM-1
Kennedy Space Center, FL 32899
Telephone: 407-867-2520
FAX: 407-867-1150

Spectrum Manager
Langley Research Center
Mail Stop 488
Hampton, VA 23681-0001
Telephone: 804-864-1863
FAX: 804-864-7944

Spectrum Manager
Lewis Research Center
21000 Brookpark Road, Mail Stop 142-1
Cleveland, OH 44135
Telephone: 216-433-5077
FAX: 216-433-8000

Spectrum Manager
Johnson Space Center
Code EA44
Houston, TX 77058
Telephone: 713-483-0122
FAX: 713-244-6179

Spectrum Manager
Marshall Space Flight Center
Code AI52
Marshall Space Flight Center, AL 35812
Telephone: 205-544-0140/3456

Spectrum Manager
Wallops Flight Facility
Code 822.1
Wallops Island, VA 23337
Telephone: 804-824-1278
FAX: 804-824-1826/1623

Spectrum Manager
John C. Stennis Space Center
Code GA20
Stennis Space Center, MS 39529
Telephone: 601-688-2279
FAX: 601-688-1491

National Security Agency
Frequency Manager/G042
9800 Savage Road
Ft. George G. Meade, MD 20755
Telephone: 301-688-5896
FAX: 301-688-7079

National Science Foundation
Frequency Coordinator
National Optical Astronomy Observatories
P.O. Box 26732
950 North Cherry Avenue
Tucson, Arizona 85726
Telephone: 602-327-5511

Frequency Coordinator
National Astronomy and Ionosphere Center
Arecibo Observatory Box 995
Arecibo, Puerto Rico 00612
Telephone: 809-878-2612

Frequency Coordinator
National Center for Atmospheric Research
P.O. Box 3000
Boulder, Colorado 80307
Telephone: 303-497-2020

Frequency Coordinator
National Radio Astronomy Observatory
Very Large Array (VLA)
P.O. Box 0
Socorro, New Mexico 87801
Telephone: 505-772-4240

Frequency Coordinator
National Radio Astronomy Observatory
P.O. Box 2
Green Bank, West Virginia 22944
Telephone: 304-456-2011

Navy, Department of the
Naval Ship Research and Development Center
Annapolis Division
Annapolis, Maryland 21402
Telephone: 301-267-3252
IDS Code 1229-3252

Naval Weapons Center
China Lake, California 93555
Telephone: 714-375-1411, Ext. 2340
Autovon: 245-6208

Naval Surface Warfare Center
Dahlgren Division
Coastal Systems Station
Panama City, Florida 31407-5000
Telephone: 904-234-4625
DSN: 436-4625

Naval Surface Weapons Center
Dahlgren, Virginia 22448
Telephone: 703-663-8531, Ext. 427, 573 or 975
IDS Code 1232-8531, Autovon: 249-8311

Naval Underwater Systems Center
New London, Connecticut 06320
Telephone: 203-442-0771, Autovon: 636-0111

Pacific Missile Range Facility,
Hawaiian Area
Kekaha, Kauai, HI 96752
Telephone: 808-471-6231
Autovon: 315-471-6231

Pacific Missile Test Center
Point Mugu, California 93042
Telephone: 805-982-7983, Autovon: 351-7983

Naval Air Development Center
Warminster, Pennsylvania 18974
Telephone: 215-441-2259, Autovon: 441-2259

Commander
ATTN: Mr. Mikel Ryan, Code 5.1.4A, Bldg. 1406
Naval Air Warfare Center Aircraft Division
23029 Cedar Point Road, Unit 4
Patuxent River, Maryland 20670-1183
Telephone: 301-342-1194 or 1532
FAX/STU III: ext. 1200
ASPECTS BBS: ext.1195
Autovon: 326-1194 or 1532

Naval Research Laboratory
Chesapeake Bay Detachment
Chesapeake Beach, Maryland 20732
Telephone: 301-257-4000 or 257-4055

Naval Ocean Systems Center
San Diego, California 92152
Telephone: 714-225-6011, Ext. 527
Autovon: 933-1011

Naval Research Laboratory
Washington, D.C. 20390
Telephone: 202-767-3200
IDS Code 197-3200, Autovon: 297-3200

Naval Surface Weapons Center
White Oak, Silver Spring, Maryland 20910
Telephone: 301-394-1242, Ext. 704
Autovon: 290-1242

Atlantic Fleet Weapons Training Facility
U.S. Naval Station, Box 3023
FPO Miami, Florida 34051
Telephone: 809-865-2000, Ext. 5223; 809-865-7245, Ext. 227, Autovon: 831-5223/4245

Naval Electronic Systems Engineering Activity
(NESEA)
St. Inigoes, Md. 20684
Telephone: 301-862-8400
Autovon: 356-3512; FTS 923-8400

Midway Research Center
P.O. Box 727
Stafford, Virginia 22555
Telephone: 703-690-1844
FAX: 703-221-3317

Transportation, Department of
Transportation Systems Center
Kendall Square
Cambridge, Massachusetts 02142
Telephone: 617-494-2424
ATTN: Mr. Carol Veronda

Transportation Test Center
Pueblo, Colorado 81001
Telephone: 303-326-9218
ATTN: Mr. W. P. McCutchon

7.12 USE OF FREQUENCIES AUTHORIZED TO NON-GOVERNMENT STATIONS UNDER PART 90 OF THE FCC RULES

A Government radio station may utilize any frequency authorized to a non-Government radio station under Part 90 of the Rules of the Federal Communications Commission where such utilization is necessary for intercommunication with non-Government stations or required for coordination with non-Government activities, provided a mutually-approved arrangement has been concluded between the Government agency concerned, the Federal Communications Commission, and the non-Government licensee involved. All operations by Government stations under these provisions a) shall be conducted in essentially the same geographical area as those of the non-Government licensee, b) shall be restricted to the purpose for which the particular frequency is authorized to non-Government stations, c) shall be in accordance with the Federal Communications Commission Rules and Regulations, d) shall be subject to immediate termination if harmful interference is caused to the service rendered by non-Government stations, and e) shall not bar in any way the expansion of non-Government services for which the frequencies are allocated. The procedure for concluding a mutually-approved arrangement required by this provision is given in Section 8.3.3.

FCC regulations provide that non-Government stations licensed by the FCC may be authorized the use of frequencies assigned to Government radio stations upon appropriate showing by the applicant that such assignment is necessary for intercommunication with Government stations or required for coordination with activities of the Government. Such provision is subject to determination by the FCC, after consultation with the appropriate Government agency or agencies, that the assignment is necessary.

7.13 MILITARY COMMUNICATIONS UNDER APPENDIX S13 (Part A2), INTERNATIONAL TELECOMMUNICATION CONVENTION

Stations in the mobile service (including portable-type operations) of the Air Force, Army, Coast Guard, and Navy, when engaged in exercises or tactical operations, may employ any frequencies, in accordance with Appendix S13 (Part A2) of the International Telecommunication Convention provided they cause no interference with the authorized services operating on the frequencies selected.

When required by military necessity and in consonance with the provisions set forth in Appendix S13 (Part A2) of the International Telecommunication Convention, minimum performance requirements applicable to the use of Communications-Electronics equipment as prescribed in this Manual[1] may not be met.

Where under normal peacetime conditions harmful interference arises to (or from) other operations, performed in accordance with applicable regulatory provisions, as a result of such minimum performance requirements not being met, the military service(s) involved shall to the extent practicable take all reasonable measures to mitigate the harmful interference.

7.14 USE OF FREQUENCIES FOR THE PERFORMANCE OF ELECTRONIC ATTACK TEST, TRAINING, AND EXERCISE OPERATIONS

IRAC Document 30950 as amended by 31050 is Chairman of the Joint Chiefs of Staff Manual CJCSM 3212.02, dated October 1, 1998, *Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises.* CJCSM 3212.02, mandatory for all DoD components and contractors, contains the details

concerning authorized frequency bands, geographical restrictions and frequency clearance procedures for electronic attack in the U.S. and Canada.

CJCSM 3212.02 is only approved for limited release. DoD components (to include the combatant commands) and other Federal agencies may obtain copies of this manual through controlled Internet access only (limited to .mil and .gov users) from the CJCS Directives Home Page – http://www.dtic.mil/doctrine/jel.htm.

7.15 MILITARY COMMUNICATIONS FOR TACTICAL AND TRAINING OPERATIONS

7.15.1 Military Communications in the Bands 3500-4000, 20010-22000, and 22855-24990 kHz for Tactical and Training Operations

To meet local military peacetime tactical and training requirements within the United States and Possessions, the military services may employ frequencies in the bands 3500-4000, 20010-22000, and 22855-24990 kHz on a secondary basis to the services of stations authorized on frequencies within these bands provided that:

1. Operations shall be with field-type portable and mobile equipment.

2. Minimum antenna power shall be used commensurate with the actual communication requirement but not in excess of 50 watts.

3. The bandwidth of emission shall not exceed 6 kHz for the lower band or 36 kHz for the upper bands.

4. Prior to transmission, responsible military personnel shall ascertain that services being performed in the local area will not be disrupted or suffer harmful interference as a result of such military use of frequencies within the local area.

5. The use of any frequency authorized herein shall be terminated immediately upon notification that harmful interference is being caused.

7.15.2 Military Communications in the Broadcast Bands between 4 and 27 MHz, the Maritime Mobile Band between 4.005 and 4.063 MHz, and Specified Frequencies between 2 and 27 MHz for Tactical and Training Operations

The military services may employ frequencies in the bands as indicated in paragraph 1 below and specified frequencies in paragraph 2 below in order to meet local peacetime tactical and training requirements within the United States and Possessions (or as indicated below). Such use of frequencies shall be on a secondary basis and subject to the avoidance of harmful interference a) to all operations established in accordance with the international allocations applicable to those bands and b) to all other operations regularly authorized within the United States and Possessions on specific frequencies within those bands or on the specified frequencies.

1. The use of frequencies within the following bands will be conducted as indicated in subparagraphs a) and b) and with minimum antenna power commensurate with the actual communication requirement, but not to exceed the power for specific types of emission as indicated:

kHz	kHz
4005 - 4063	13600 - 13800
5950 - 6200	15100 - 15600
9500 - 9900	17550 - 17900
11650 - 12050	
21450 - 21850	
	25670 - 26100

a. For field type portable and mobile equipment the following parameters apply:

1K10F1B	100 watts mean
100HA1A	200 watts peak
3K00J3E	250 watts peak
2K00A2B	300 watts peak
3K00J7B, 4K00J7B	400 watts peak
3K00J9W, 4K00J9W, 6K00J9W	600 watts peak
6K00B9W	800 watts peak

b. For shipboard mobile equipment the following parameters apply:

100HA1A	500 watts peak
100HJ2A	500 watts peak
3K00J3E, 2K80J3E	500 watts peak
3K00J7B	1000 watts peak
6K00B9W	2000 watts peak

2. The use of the following frequencies, as indicated below, will be controlled by and coordinated between the Military Departments Frequency Management Offices for operations conducted a) normally between transportable and fixed facilities engaged in long haul HF operations and b) with minimum antenna power commensurate with the actual communication requirement, but not to exceed 10 KW, and with 6K00B9W, 9K00B9W and 12K00B9W emissions only.

kHz	kHz	kHz
2001.0	9958.0	17500.0
2582.0*	9970.0(4)	17519.0(3)
2618.0(9)	10586.0(2)	18036.0(1)
2664.0(12)	10690.0	18060.0
2797.0*	10720.0(5)	18162.5(11)
3373.0	10730.0	19005.0
4445.0	11410.0(6)	19047.0
4505.0(4)	11422.5(5)	19160.0
4528.0	11482.5	19510.0(4)
4562.5	11513.5(4)	20035.0
4595.0(6)	11535.0	20050.0
4985.0(4)	11995.0(10)	20075.0
5370.0(4)	12045.0(2)(10)	20124.0
5400.0(3)	12060.0	20151.0
5434.0	12090.0	20350.0(8)
5817.5(2)	12105.0	20400.0
5820.0(2)	12240.0(10)	20425.0
5835.0*	12255.0(2)(10)	20438.0(5)
6830.0	12324.0(4)(10)	20550.0
6897.5(1)	13545.0	20763.0
6905.0	13610.0(4)(10)	20950.0(5)
6912.5	13680.0(10)*	21856.0(6)
6989.0	14375.0	21886.0(6)
7362.5(5)	14385.0	21918.0(6)
7469.0(1)	14646.0	23180.0
7690.0(1)	14667.0(6)	23500.0
7935.0	14867.5	23600.0
8000.0(5)	15595.0(1)(10)	23690.0
8041.0	15895.0	23700.0
8060.0	16090.0	24120.0
8064.0	16100.0	24510.0
8162.0(10)	16170.0	25360.0
8170.0(10)	16225.0(5)	25425.0
9145.0	16340.0	25516.0
9190.0(3)(9)	16422.5(6)(10)	26575.0(9)
9259.0(7)	17410.0(1)(8)(10)	26650.0(5)
9320.0(4)	17460.0	26750.0
9417.5	17480.0	26850.0

*6KB9W and 9KB9W only
[1]Transmit east of 100° west only
[2]Transmit west of 100° west only
[3]Transmit east of 117° west only
[4]Transmit west of 117° west only
[5]NAVCOMMSTA Stockton transmit only
[6]USA to USA only
[7]Not to be used to/from Norfolk, Va
[8]Military services to coordinate with Justice before use
[9]6KB9W only
[10]This frequency is available until implementation procedures and schedules are determined by future conferences of the International Telecommunication Union (ITU) for Broadcasting or Maritime Mobile Services.
[11]This frequency is available until reaccommodation actions of the International Telecommunication Union (ITU) are completed or until July 1, 1989, whichever is earlier. [12]For use within central U.S. Coordinate with Coast Guard prior to use near Coast Guard/Coastal areas.

7.15.3 Military Communications in non-Government Bands Above 25 MHz for Tactical and Training Operations

The military services may employ frequencies in certain non-Government bands above 25 MHz, after coordination between FCC field personnel and military field personnel, for tactical and training operations in the U. S. and Possessions in accordance with the arrangement between the FCC and the Military entitled "Field Coordination of Military Tactical and Training Assignments 25-2400 MHz." The military use of non-Government frequencies under the procedures stipulated will not be a bar to the present or future assignment, through the normal IRAC/FCC process, of non-Government frequencies to non-military Government agencies, and, in such military use of non-Government frequencies, protection shall be afforded to Government operations authorized on specific frequencies within the non-Government frequency bands concerned. The text of the arrangement between the FCC and the Military follows.

1. In order to provide for military tactical and training assignments in the United States and Possessions, FCC field personnel and military field personnel are authorized to coordinate such assignments without referring these matters to Washington headquarters.

2. Military agencies have agreed that prior to coordinating tactical and training frequency assignments with FCC field offices, military field representatives will first establish that proposed assignments have a good chance of being compatible with non-Government assignments. Consequently, FCC Field Engineers in Charge (EIC) are not expected to "engineer" such assignments for the Military.

3. The following procedures will apply to the use of the non-Government bands between 25 and 2400 MHz specified herein:

a. The Military will not request the use of frequencies allocated to non-Government services whenever the tactical and training requirements can be met through the use of Government bands.

b. Military tactical and training assignments shall cause no harmful interference to non-Government assignments and military operations shall be terminated immediately upon notification that harmful interference has occurred.

c. Military tactical and training assignments must accept such interference as may be caused by non-Government assignments.

d. Tactical and training assignments shall be temporary for a period of no longer than one year and the military representatives shall recoordinate if continued use is desired. The military field representatives shall maintain a current list of such assignments and furnish the EIC with three copies thereof annually.

4. The following shall be used as a guide for the coordination of military tactical and training assignments when it has been determined that the use of non-Government bands is necessary:

a. Bands allocated to the Broadcasting Service for domestic use.

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

MHz	MHz
54-72	174-216
76-100 (ex. Alaska)	470-608
100-108	614-890

(2) FCC field engineers are acquainted with the areas being served by broadcasting stations and these engineers will not permit military tactical and training assignments on TV or FM channels in the areas where the public is receiving service. In many instances such service is received far beyond the normal service ranges of broadcasting stations. However, reception in such areas shall be protected regardless of the *quality* of such reception.

b. Bands used for auxiliary broadcast purposes.

(1) The following are the bands between 25 and 2400 MHz that are allocated for this use:

MHz	Use
25.85-26.48	Remote Pickup
152.86-153.35	Remote Pickup
160.86-161.40	Remote Pickup (Puerto Rico and Virgin Islands only)
161.625-161.775	Remote Pickup (except in Puerto Rico and Virgin Islands)
450-451	Remote Pickup
455-456	Remote Pickup
942-952	STL
1990-2110	TV Pickup, TV-STL

(2) Frequencies in bands used by remote pickup, studio transmitter links and other broadcast auxiliaries may be used for military tactical and training purposes providing FCC field engineers coordinate such use with the appropriate broadcast station licensees. For example, there is no objection to a military tactical and training assignment co-channel to a remote pickup assignment in the same area provided the broadcast licensee is cognizant of such arrangements and can be assured that in the event a remote broadcast pickup is necessary, any military operations that may be on the air will shut down immediately upon notification.

As an additional example, frequencies which are assigned to studio transmitter links may be utilized by military tactical and training assignments, providing these assignments are coordinated by the FCC Field Representative with the broadcast licensees involved and the tactical and training assignments so arranged as to cause no harmful interference to an STL. In all cases where a tactical and training assignment is made on an auxiliary broadcast service frequency within interference range of a co-channel FCC licensee, the licensee should be given the name of the military representative to contact in the event interference is caused.

c. Public Safety, Citizens Radio, Industrial, Land Transportation and Maritime Mobile Bands.

(1) The following bands between 25 and 2400 MHz are allocated for this purpose:

MHz	MHz	MHz
25.01-25.33	39.00-40.00	156.675-156.725
26.96-27.54	42.00-43.20	156.875-157.025
29.70-29.80	43.68-46.60	157.45-157.74
30.56-32.00	47.00-49.60	158.10-158.46
33.00-34.00	150.80-152.00	158.70-161.775
35.00-35.20	152.24-152.48	173.20-173.40
35.68-36.00	152.84-156.25	451.00-454.00
37.00-38.00	156.325-156.625	456.00-459.00
		460.00-470.00

(2) Frequencies in bands allocated to these services for land mobile use may be authorized for military tactical and training assignments provided the assignments are coordinated between FCC field engineers and military field representatives. The set of curves attached hereto should be used as a guide in these matters. These curves are a combination of propagation theory backed up by considerable measurement data and they do not necessarily represent finite values upon which engineering determinations may be made. Consequently, personnel in the field will need to take into consideration such factors as local terrain. For example, an obstruction such as a hill or a mountain range might lower considerably the distance between a non-Government and a military tactical and training assignment. On the other hand, there are certain locations where better than average radio propagation conditions exist, and it will be necessary for FCC field engineers and military representatives to take this into account. If doubt exists as to the practicability of a proposed tactical and training assignment, tests should be conducted.

d. Bands allocated to non-Government fixed service (excluding common carriers).

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

MHz	MHz
72.0-73.0	1850-1990
75.4-76.0	2130-2160
76.0-100 (In Alaska)	2180-2200
952-960	

(2) In bands allocated to the non-Government fixed service (excluding common carrier), military tactical and training assignments may be authorized after coordination with appropriate FCC field offices. It is not possible to develop typical standards for the coordination of such assignments in fixed bands due to the fact that, in general, highly directive antenna are used and problems of interference protection will vary greatly. Since many military tactical and training operations involve the use of highly directive antennas, it may sometimes be possible to coordinate such assignments, although they may be in the same area as non-Government assignments, by taking into account directive antenna features of the installations involved. In coordinating such assignments FCC field engineers are urged to coordinate proposed military tactical and training assignments with FCC licensees whenever there is a doubt as to the compatibility of the proposed military assignments. Tests should be conducted if necessary.

e. Bands allocated to non-Government aeronautical fixed and international fixed public services.

(1) The following bands between 25 and 2400 MHz are allocated for this purpose:

MHz
26.95-26.96
29.80-29.89
29.91-30.00

(2) In the above bands, military tactical and training assignments may be authorized after coordination with appropriate FCC Field Offices provided that the military use is limited to those periods when propagation conditions would not normally support long distance communication, and therefore could be expected to confine to the local area the potential of interference to non-Government services.

f. Amateur Bands

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

MHz	MHz
28-29.7	420-450
50-54	1215-1300
144-148	2300-2400
222-225	(This band extends to 2450 MHz.)

(2) The following provisions are applicable in the use of the above bands for communication purposes (i.e. for other than radiolocation purposes).

(a) Subject to the provisions of the rules adopted by the Federal Communications Commission, amateur stations generally are operated freely on any frequency within the established amateur bands. Therefore, great care needs to be taken in the coordination and in the use of such frequencies by the Military.

(b) The following conditions shall be observed in the military use of amateur frequency bands between 25 and 2400 MHz for routine day to day tactical and training purposes:

1 Operations on such frequencies will be confined normally to the hours of 0600-1800 local civil time.

2 Prior to transmission on specific frequencies, military personnel should ascertain that such frequencies are not in actual use by amateur stations within the local area in a manner which is likely to suffer harmful interference if the frequencies were used for military operation.

3[2] In recognition of the primary status of amateur stations as against the secondary status of military frequency use in such bands in peacetime, military personnel have responsibility in the event of, evidence of, or actual complaints of interference, to take effective remedial action without undue delay.

4 Insofar as practical, consideration should be given in planning the use of such frequencies to their employment in a manner or at transmitter locations well removed from areas of civilian population where amateur use is likely. Appropriate measures should be adopted to minimize interference as by the use of minimum radiated power and intermittent transmissions of short duration.

5 It should be recognized that long distance propagation characteristics of the 28 MHz and 50 MHz bands, especially in the case of the former, require that good judgment be exercised in military use of these bands. Only when sky-wave propagation is not present is it practicable to use these bands for anything except extremely low power.

5. The attached curves have been constructed through the use of the latest ITU-R PN series Recommendations and FCC radio propagation data for frequencies in the order of 150 MHz. These curves include corrections for tropospheric propagation and, as a rough guide, may be used for frequencies between 25 and 470 MHz.

The assumption has been made that it is necessary to protect non-Government services on the basis of a desired/undesired signal ratio of 12 dB (desired signal 12 dB higher than undesired signal). Additionally, it has been assumed that this protection is to be provided 90 percent of the time at 90 percent of the locations within a mobile system's service area. Also, the antenna heights of non-Government base stations have been assumed as 30 meters.

Three examples of the use of these curves have been plotted as follows:

	Undesired		Desired		Separation
	P U	H U	P U	H U	
1.	20W	3 m	100 W	30 m	138 km
2.	10W	15 m	100 W	30 m	134 km
3.	5W	30 m	100 W	30 m	124 km

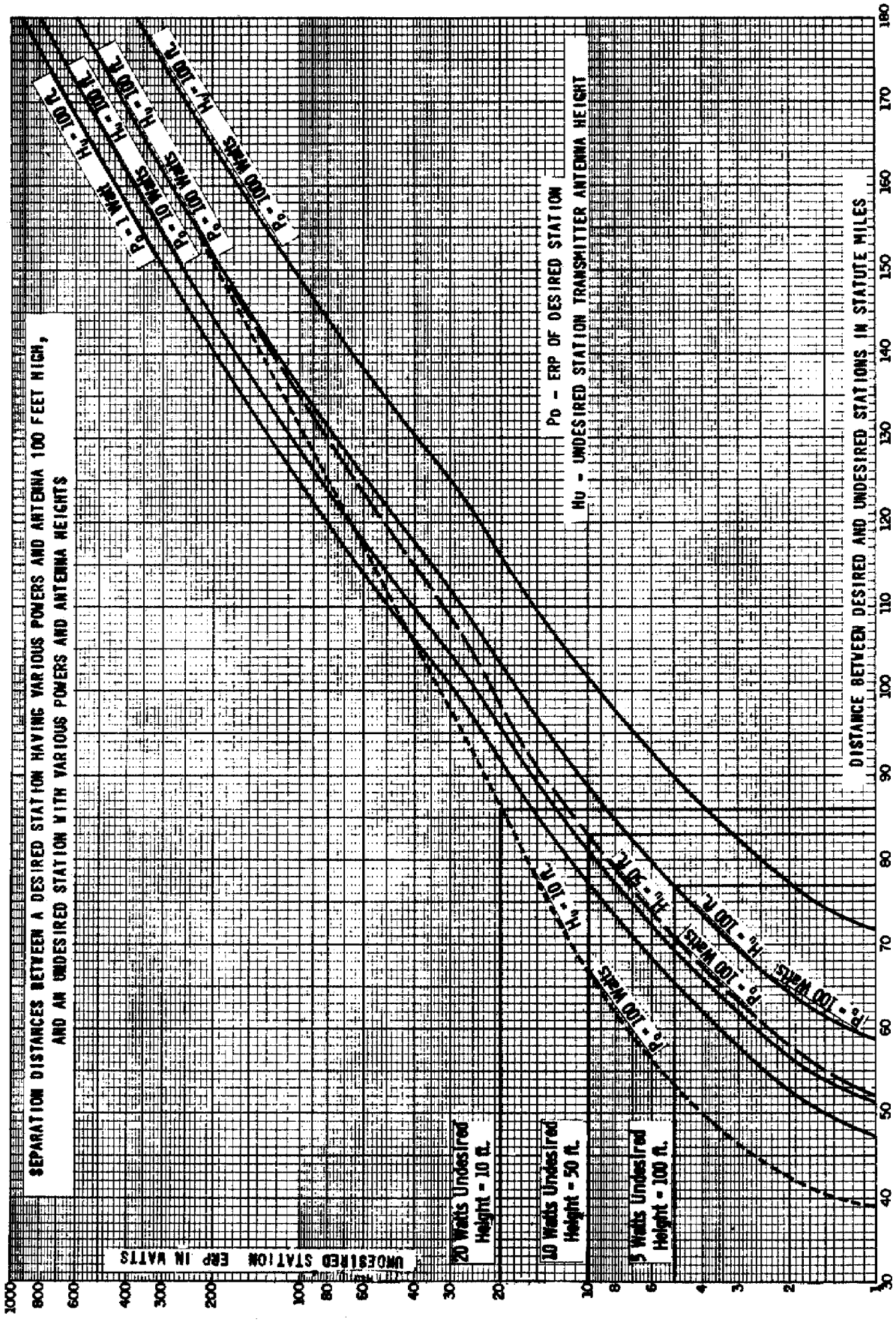
The curves have been constructed for a desired station antenna height of 30 meters. As a rule of thumb, it may be said that a 50% reduction of desired station antenna height will reduce the desired station's service range by about 25% at service distance ranges in the order of 32 to 48 kilometers. However, at distances much greater than this, the reduction in service range due to reduction in antenna height is less and may amount to as little as 10%.

In the examples shown above, a reduction of desired station antenna height from 30 to 15 meters would permit a reduction in station separation by 10% or so.

These curves should serve field engineers as a guide but should be used with a certain amount of caution, since local propagation conditions may vary considerably over the average terrain which has been assumed in the construction of the attachment.

These curves do not apply to TV and FM broadcasting. The desired to undesired signal ratio for TV signals must be 45 dB or more at the TV receiver. The desired to undesired signal ratio for FM signals must be 20 dB or more at the FM receiver.

FREQUENCY BAND 25-470 MHz



7.15.4 Military Communications in the Government Bands Between 30 and 50 MHz for Tactical and Training Operations

To meet local military peacetime tactical and training requirements within the United States and Possessions, the military services may employ frequencies in the bands 30.00 to 30.56, 32.00 to 33.00, 34.00 to 35.00, 36.00 to 37.00, 38.00 to 39.00, 40.00 to 42.00, 46.60 to 47.00, and 49.60 to 50.00 MHz on a secondary basis to the services of other Government stations authorized on frequencies within these bands provided that:

1. Operations shall be with field-type portable and mobile equipment.

2. Minimum antenna power shall be used commensurate with the actual communication requirement but not in excess of 50 watts.

3. The bandwidth of emission shall not exceed 6 kHz with type A3E emission or 36 kHz with type F3E emission.

4. Prior to transmission, responsible military personnel shall ascertain that services being performed by other Government agencies in the local area will not be disrupted or suffer harmful interference as a result of such military use of frequencies within the local area.

5. The use of any frequency authorized herein shall be terminated immediately upon notification that harmful interference is being caused.

7.15.5 Military Sensor Training

To meet military peacetime training requirements for sensors within the United States and Possessions, the Military Services may employ frequencies within the bands 162.0125-173.2 and 173.4-174.0 MHz on a secondary basis to the operations of other stations authorized for use on frequencies within these bands, provided that:

1. Operations shall be within the boundaries of a Marine Corps facility, and Army facilities at Fort Bragg, North Carolina and Yuma, Arizona.

2. Power output will normally be two watts but shall not exceed four watts maximum with an emission of 8K00F1D.

3. Frequencies listed below are authorized for use:

MHz	MHz	MHz
162.1000	**164.6500**	**167.2750**
.7750	.6875	**168.4000**
.8125	.7250	.4375
.8500	.7625	.7750
.8875	**165.0250**	.8125
163.1500	.0625	**169.1875**
.1875	.1000	.5250
.2250	.1375	.9000
.5250	.4000	**170.2750**
.5625	.4375	.6500
.6000	.5125	**171.0625**
.6375	.7750	.4000
.9000	.8125	.7750
.9375	**166.1500**	**172.1500**
.9750	.1875	.9000
164.1250	.5250	
.2750	.5625	
.3125	.6375	
.3875	.8875	
.6125	**167.0125**	

4. Transmissions shall be limited to short coded messages of 80 milliseconds or less with an operating duty cycle of less than two percent.

5. Any frequency requirement for training with remotely commanded sensors to transmit in the F3E mode shall be coordinated through the normal FAS channel.

6. Use of any frequency pursuant to the provisions of this section shall be terminated immediately upon notification that harmful interference is being caused.

7. No procurement of new systems other than for maintenance and parts support is permitted without compliance with Part 8.3 of the NTIA Manual.

8. This authority is terminated after December 31, 1994.

7.16 (RESERVED)

7.17 MILITARY COMMUNICATIONS AT TEST RANGES IN NON-GOVERNMENT BANDS ABOVE 25 MHz

The military departments may employ frequencies in certain non-Government bands above 25 MHz at specified military test ranges after coordination between FCC field personnel and military field personnel.

7.17.1 Locations

The military test ranges and the Geographical Areas of Cognizance are as follows:

Activity	Geographical Area of Cognizance	Service Responsibility
Weapons and Tactics Center, Nellis AFB, Nevada	Entire State of Nevada plus Utah west of 111°W and Idaho South of 44°N.	Air Force
Air Force Eastern Test Range, Patrick AFB, Florida	Area bounded by 24°N, 31°30'N, 77°W, and 83°W.	Air Force
Air Force Development Center, Eglin AFB, Florida	Area bounded by 27°N, 33°30'N, 83°W and 90°W.	Air Force
Pacific Missile Test Center, Pt. Mugu, California	Area enclosed within 322 kilometer radius of Headquarters Building, PMR, and the area of California that lies south of 37°30'N.	Navy
Army Electronic Proving Ground, Ft. Huachuca, Arizona	Entire State of Arizona	Army
Military Ranges within the State of Hawaii	Area enclosed by 322 kilometer radius of Honolulu, Hawaii	CINCPAC
Atlantic Fleet Weapons Training Facility, Roosevelt Roads, P.R. (AFWTF)	Area within 370 kilometers of Headquarters Building, AFWTF.	Navy
White Sands Missile Range, Las Cruces, New Mexico	Entire State of New Mexico and other U.S. territory enclosed with a 240 kilometer radius of the Headquarters Building, SWMR, plus the area of the States of Utah and Colorado that lies south of 41°N and between 108°W and 111°W.	Army

7.17.2 Frequency Bands

Frequencies in the following bands may be used in these geographical areas in support of the mission of these ranges, subject to the conditions and procedures specified in this part:

MHz	MHz
25.01-25.33	144.0-148.0
25.85-26.48	150.8-156.25
26.95-27.54	156.35-156.7
28.00-29.89	156.9-157.0375
29.91-30.00	157.1875
30.56-32.00	162.0125
33.00-34.00	174.0-216.0
35.00-36.00	450.0-608.0
37.00-38.00	614.0-890.0
39.00-40.00	942.0-960.0
42.00-46.60	1850-2110
47.00-49.60	2450-2690
50.00-73.00	6425-7125
75.40-108.00	10550-10680
	11700-13250

Frequency bands above 13250 MHz are under consideration and will be designated later.

7.17.3 Conditions

Non-Government allocated bands will not be used if the frequency requirements can be satisfied in Government allocated bands.

Proposed operations on non-Government frequencies should normally be limited to those of a highly intermittent nature which can be suspended or adjusted immediately upon notice that interference is being caused to a non-Government service. Care should be exercised in the selection of frequencies for proposed operations to avoid the likelihood of harmful interference to known non-Government operations. Where practicable, provision shall be made for identification of the transmissions of the military station either by the transmission of a call sign or periodic interruption of the transmissions in accordance with a prearranged schedule.

Military users of any frequency assigned pursuant to this procedure shall accept any interference that may be caused by non-Government services, shall not cause interference to any non-Government service, and shall not preclude new non-Government assignments on such a frequency.

This procedure does not apply to the development of military systems or concepts which may require changes in the National Table of Frequency Allocations. Any such development must be coordinated through appropriate Washington channels.

7.17.4 Coordination

Proposed Government operations on non-Government frequencies which come within the purview of this procedure shall be coordinated with the FCC Engineer in Charge of the Radio District in which the contemplated operation will occur, *prior* to the commencement of such operation. No operation on non-Government frequencies shall be conducted without *prior* concurrence by the FCC District Engineer. If the FCC District Engineer is unable to concur in a proposed operation and circumstances appear to warrant further consideration by higher authority, the request may be referred to military headquarters. Similarly, if the FCC District Engineer believes that circumstances warrant such action he may refer the matter to the Washington Office of the FCC.

Requests for coordination submitted to the FCC District Engineer shall include the following information:

1. Security classification, if any.

2. Frequency or frequencies proposed to be used.

3. Transmitter location or area of proposed operation. (If the transmitter is at a fixed location, give the geographic coordinates to the nearest minute as well as the nearest identifiable community. If the operation is portable or mobile, describe the area of proposed operation. If the transmitter is airborne, so specify and describe the general range of operations.)

4. Emission and bandwidth. (If pulsed emissions are used, give the approximate risetime and repetition rate.)

5. Power. (Output power of transmitter.)

6. Antenna. (Give type of antenna (whip, dipole, yagi, parabolic, etc.) approximate height of antenna above ground, power gain if any, and direction of main radiation lobe if a directive transmitting antenna is employed.)

7. Time of operation. (To the extent practicable, indicate whether the proposed operation will take place at specified hours or during certain periods of the day, whether the transmissions during operation will be continuous or intermittent with some indication as to the degree of intermittence, and whether the contemplated use will occur frequently or only upon special occasions. Such information will assist the FCC District Engineer in properly evaluating potential interference.)

8. Call signs. (Call sign information should be supplied, if appropriate. If identification is to be accomplished through periodic interruptions of the transmissions in accordance with a prearranged schedule, supply such a schedule.)

9. Expected duration of the proposed operation.

10. Remarks. (Any additional information which will be helpful in assessing potential interference.)

Military frequency coordinators shall not coordinate proposed frequencies with the FCC until it has been ascertained, to the coordinator's satisfaction, that the terms of this document can be met.

7.17.5 Frequency Assignment Lists

On an annual basis the military frequency coordinators will furnish in duplicate to the appropriate FCC Engineers in Charge a list of current assignments made pursuant to these arrangements.

7.18 MILITARY TELEMETERING AND TERRESTRIAL TELECOMMAND IN RADIOLOCATION BANDS

In order to transmit command signals to airborne vehicles being tracked and to receive status information from the vehicles, military telemetering and terrestrial telecommand operations are authorized in the bands 3100-3700, 5250-5925, 8500-10,000 MHz, 13.4-14.0 and 15.7-17.7 GHz when conducted as an integral part of the operation of authorized stations in the radiolocation service. Such telemetering and terrestrial telecommand operations shall be on a secondary basis to authorized stations operating in accordance with the National Table of Frequency Allocations.

7.19 (RESERVED)

7.20 USE OF NON-GOVERNMENT FREQUENCIES BY THE FCC FIELD OPERATIONS BUREAU

The FCC Field Operations Bureau is authorized to transmit on any frequency that is allocated for non-government use under FCC Rule Parts 21, 22, 73, 74, 81, 83, 87, 90, 95 and 97 for the purpose of enforcement and/or interference resolution.

7.21 TEMPEST ZONE TESTING OF PHYSICAL FACILITIES

1. Government stations are authorized to transmit necessary emissions for TEMPEST zone testing in the frequency range 10 to 1000 MHz on a non-interference basis to other operations in this band. These TEMPEST zone tests shall be conducted with the following restrictions:

a. The frequency range 10-1000 MHz will be broken into four bands for testing: 10-110 MHz, 100-200 MHz, 200-500 MHz and 500-1000 MHz. A bi-conical antenna will be used for 10-200 MHz. A log periodic antenna will be used above 200 MHz.

b. Testing will be done with a signal generator which produces a continuously swept sine wave. Sweep durations will not exceed two seconds for bands 10-110 and 100-200 MHz; or five seconds for the band 200-500 MHz; or 10 seconds for the band 500-1000 MHz.

c. The transmitting antenna will always be inside a building, and power will not exceed 3.5 watts input to the antenna.

2. Prior to conducting a test, coordination by the test Agency's Frequency Assignment Subcommittee (FAS) Representative shall be effected with FAS Representatives of all government agencies and the FCC whenever such tests could affect their radio stations or FCC licensees.

3. Non-government stations conducting TEMPEST zone testing under contract should apply for license under Part 5 (Experimental Radio Services) of the FCC Rules. These operations shall be coordinated with the contracting agency and other government agencies by the FCC FAS Representative, as appropriate.

7.22 USE OF FREQUENCIES 10.525 GHz AND 24.150 GHz OR THE BAND 33.4-36.0 GHz FOR RADIOLOCATION DEVICES

Federal agencies may operate radio units for the purpose of determining distance, direction, speed or position by means of a radiolocation device on the frequencies 10.525 GHz and 24.150 GHz or in the band 33.4-36.0 GHz, provided FCC type-accepted equipment or equip-ment developed with identical standards or specifications is used.

7.23 DOMESTIC USE BY THE FEDERAL GOVERNMENT OF COMMERCIALLY OFFERED MOBILE-SATELLITE SERVICES

Federal Government land mobile (transportable) or aircraft earth terminal used in the United States with commercially offered mobile-satellite services shall use Federal Communications Commission (FCC) authorized service provider(s).

Federal Government aircraft earth terminals shall use FCC authorized service provider(s) for commercially offered services on all domestic flights or on flight segments that originate and end in the United States even when the origination or termination point of flight is in another country.

1. Exceptions

The following Government uses of commercially offered land mobile (transportable) and aircraft earth terminals are excepted from the requirement to use FCC authorized service provider(s) in the United States.

a. INMARSAT A terminals owned by the Government.
b. Training use of earth terminals whose intended deployment is outside the United States.
c. The operational use of land mobile (transportable) and airborne earth terminals that will be used internationally for commercial offered services and cannot be switched by the user between the international commercial service provider(s) and the FCC licensed domestic commercial service provider(s).
d. The operational use of land mobile and airborne earth terminals for services that are not available from FCC licensed domestic commercial service providers, such as, Type I encryption and high speed data, or their use would not meet mission requirements, or would cause unacceptable delays or disruption, or would cost more than using INMARSAT.

Endnotes for Chapter 7

1. Necessary bandwidths as prescribed in Section 6.3.2. Frequency tolerance as prescribed in Part 5.1. Other minimum performance requirements as prescribed in Parts 5.5 and 5.6.

2. This refers to military use for communication purposes and not to military radio location uses which have priority status in the amateur bands above 222 MHz.

(Last page in Chapter 7)